

A THREE-SPACECRAFT MISSION DESIGN FOR LISA

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The Laser Interferometer Space Antenna (LISA) will be capable of detecting gravitational waves with frequencies from 0.1 mHz to 1 Hz by using laser interferometers to monitor changes in the distances between proof masses in spacecraft separated by several million km. LISA will detect strains as low as 10^{-23} with a 1 yr observation time and a S/N ratio of 5. The sensitivity will be sufficient to detect gravitational waves from sources connected with massive black holes in the centers in many galaxies, and from many binary systems within the Milky Way galaxy. Under the concept presented, LISA would be formed by three spacecraft at the vertices of an equilateral triangle with side length 5 million km. The orbits are chosen so that the triangle formation trails the Earth by 20 degrees. Each spacecraft contains two independent payloads containing a proof mass, laser and 30 cm diameter telescope for the transmission and reception of laser signals. Two independent Michelson interferometers are formed allowing both polarizations of gravitational waves to be detected.

Submittal Information

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2. COSPAR session HO.1
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4. No special equipment
5. Poster preferred
6. Not applied for financial support